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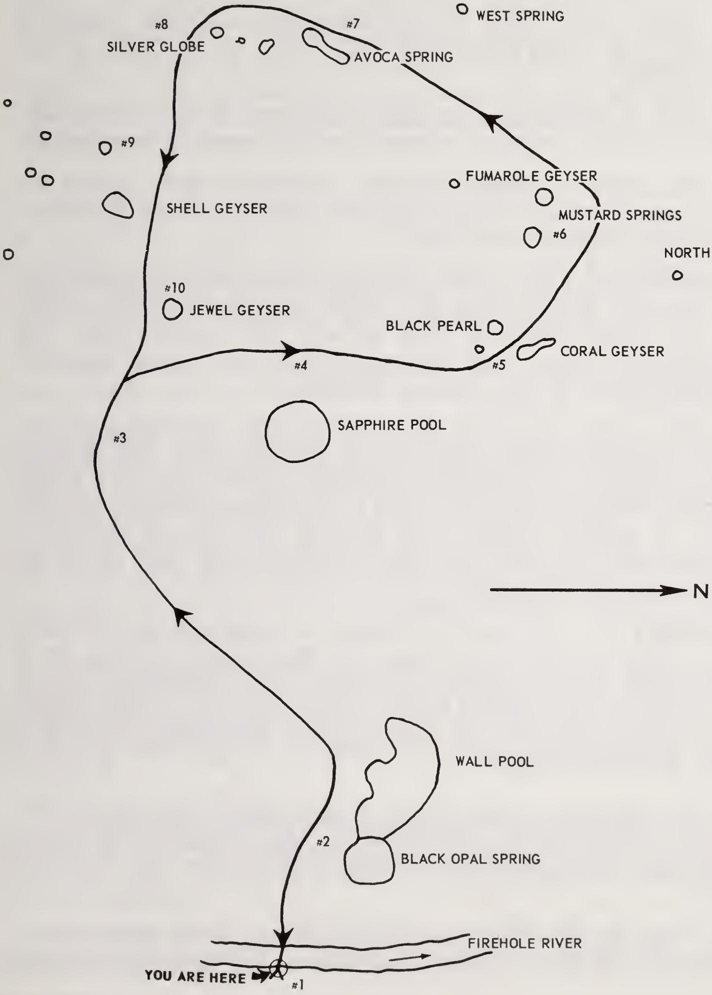
U. S. DEPARTMENT OF THE INTERIOR
National Park Service

Biscuit Basin Self-Guiding Nature Trail
Yellowstone National Park



The above sketch shows the hot springs covered by this trail.

BISCUIT BASIN SELF-GUIDING NATURE TRAIL
YELLOWSTONE NATIONAL PARK

One of the main objectives of the National Park Service is to preserve the beauty and uniqueness of the hot springs for you and for those who follow. This ideal can be realized only to the extent that Park visitors cooperate by refraining from all experimentation or acts of vandalism.

STAY ON THE BOARDWALKS. THEY ARE A MEANS OF PROTECTION TO YOU AND THE FORMATIONS.

This is called Biscuit Basin because of the biscuit-like structure of the mineral geyserite about some of the springs.

The trail is about one-half mile in length. Along its course are a number of springs that were profoundly affected by the 1959 earthquake.

STATION 1—This is the Firehole River. Hundreds of geysers and hot springs line its course, pouring their hot water into it. Upon entering this stream the water from Old Faithful and other hot springs starts on a long journey. Its destination is the Gulf of Mexico.

The water from the hot springs has surprisingly little effect in raising the temperature of the river. The geyser water contains no harmful minerals. This, plus the slight increase in temperature it adds to the stream makes it beneficial to aquatic plant and animal life, which exists in abundance. This does not mean that fish are easy to catch. They are well educated.

STATION 2—Notice the blocks of rock, some of them large, strewn about the crater of Black Opal Spring. It is one of very few springs in the Park that suggests an explosive origin. It happened before 1870, the date of discovery. The rock fragments are made up of cemented gravel and sand, of glacial origin.

On infrequent occasions Black Opal will erupt. The eruption consists of a momentary, huge surge which sends thousands of gallons of boiling water into the Firehole River.

Prior to the 1959 earthquake Black Opal was characterized by dark opalescent coloration. Following the quake

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its water became very murky. The pre-earthquake hues have not yet been re-established.

A constriction of naturally cemented gravel, over which water is flowing, separates Black Opal from Wall Pool. Prior to the 1959 earthquake Wall Pool did not seem to have a source of water of its own. The water was quite cool, and was replenished by part of the overflow from Sapphire, a spring farther up the slope. Following the quake springs developed in the far end of the big crater, resulting in a higher temperature for the pool.

Notice the break near the walk on the shoulder of Wall Pool. This was caused by the earthquake. This fracture extends for a distance of about 150 feet, partially encircling the pool.

STATION 3 — The large boiling spring to the right of the walk is Sapphire Pool. Its activity was profoundly altered by the 1959 earthquake, changing it into one of the largest and most spectacular geysers in the Park. Its eruptions have produced a marked erosion. During major eruptions a great wall of water rolls in all directions, gouging the formations. The geyserite about the crater has been lowered by several inches. Tons of broken rock fragments have been washed into the Firehole River, making large deltas. The delta that formed in the channel on the left of the walk completely blocked all flow of the stream. The hot springs you see on the river bank to the left were formed by the earthquake. Two are in the bottom of the river.

Geyserite, or silicious sinter, belongs to the quartz family of minerals. Chemically it is true opal, but a very porous variety. Evaporation is the principal factor in bringing about its slow deposition about the hot springs. Sapphire is now eroding formations it was hundreds of years in depositing.

Take the right fork.

STATION 4 — While called a "pool", Sapphire has functioned as a true geyser during all of its known history. Prior to the 1959 earthquake it was possible to approach near the edge of the crater and watch the eruptions. They occurred about every 15 to 20 minutes and were characterized by the water surging up from 3 to 6 feet.

Between the eruptions, when the water was calm, Sapphire presented a jewel-like appearance. Of the blue springs in Yellowstone Park that were crystalline clear, Sapphire without doubt was the loveliest. During the quiet phase its water scintillated with all the beauty and brilliance of the Oriental sapphire.

On the morning following the earthquake Sapphire was in a state of violent boiling. Its water was murky and was jetting up about 8 feet. Periodic activity ceased. The boiling was constant. On September 5 a spectacular change occurred in its manner of function. At approximately 2 hour intervals it began having major eruptions. The eruptions would come suddenly and explosively and would lift a huge mass of rocketing jets of water to heights that varied between about 100 and 125 feet. Occasionally there would be a burst fully 150 feet in height.

The eruptive activity that started on September 5 continued through September 13. From the 14th through the 28th it lapsed back into steady geyser function. On the morning of the 29th it was again periodically erupting on a major scale.

Following the September 29 rejuvenation Sapphire erupted for several days in a manner similar to the earlier pattern. Its eruptions then started coming with greater frequency, the intervals being between about 30 and 90 minutes. Occasionally there would be a near 2 hour interval.

With shortened intervals the eruptions decreased in magnitude. Instead of the crater filling before an eruption, it would occur when the water was anywhere from a foot to 3 feet below the crater rim. The higher the water in the crater, the more forceful and voluminous would be the explosions. This type of activity persisted until the middle of January, 1960.

Since the above date Sapphire has been having active and dormant cycles. During the dormant cycles the boiling and overflow are constant. If at the time of your visit the water is standing below the rim of the crater it may suggest a present active cycle. Inquire of a Park Ranger, or at the Old Faithful Visitor Center, as to Sapphire's present state of activity, and when an eruption may be expected.

STATION 5—Coral Geyser is to the right of the walk. It consists of two vents. There are a number of openings in the vent farthest from the walk, which openings will be very much in evidence when the geyser is erupting.

The time between eruptions for both vents is from 9 to 12 minutes. The eruptions usually come independently of each other, but on occasions both vents play simultaneously. The heights of the eruptions vary from 6 to 8 feet. They last less than a minute.

The beady, or coral-like, structure of the geyserite results from the splashing of the water during an eruption. The action of the hot springs determines the form or shape the mineral assumes.

Black Pearl Geyser is directly across the walk from Coral Geyser. It is cyclic in its activity. That is, some years it is active, others it is dormant. The 1959 earthquake initiated an active cycle. For several weeks following the quake the water boiled constantly. The boiling now occurs periodically, the intervals being from 15 to 20 minutes.

The black, beady geyserite in the crater which was responsible for the name has almost entirely disappeared.

STATION 6—The behavior of the two large springs to the left of the walk underwent marked changes at the time of the 1959 earthquake. Prior to the quake the temperature of West Mustard, the one on the left, was 163°, East 157°. The bowls of both springs were lined with yellow algae, hence the name Mustard. Algae are primitive forms of plant life. They give color also to the drainage channels leading away from the hot springs.

On the morning following the quake, water which previously had overflowed steadily had dropped about 30 inches in both craters, and for the rest of the year both were constant spouters. The temperature in both springs rose to 200° F.

The boiling in Mustard Springs varies in violence. The degree of boiling changes with the rise and drop of the water in the craters. They are developing characteristics of true geysers.

Directly back of Mustard Springs about 100 feet is a small geyser that owes its origin to the 1959 earthquake.

It first began as a steam vent (fumarole). Following the quake numerous fumaroles began hissing through the sands near Mustard Springs. During the past winter one of them excavated a crater and developed into a true geyser.

It is called Fumarole Geyser. It has a sizzling action, playing to a height of about 3 feet. The eruptions last from 30 to 45 minutes and occur with about the same frequency. Thus it is playing about half of the time.

There are two springs to the right of the walk. The farthest one is North Geyser. Its action consists of one or more spouts which occur about every 3 to 10 minutes. It is not always in an active cycle.

STATION 7 — Avoca Spring is on the left of the walk. Its crater consists of 3 sections. The bowl on the right emptied the night of the quake and has not refilled. With the drop of the water in the left crater it turned into a periodic steam vent. At about one minute intervals there would be a momentary roar of rushing steam.

During the past winter the steam vent developed into a geyser. Like the steam intervals, the eruptions occur about every minute.

STATION 8 — On the morning following the quake the bowls of these previously overflowing springs had emptied. They are still empty. Only one was named, Silver Globe. It is the one farthest from the walk.

Note the spiny geyserite in the crater near the walk. These spines have the appearance of a petrified forest.

STATION 9 — This spring was named Shell because of the fancied resemblance of the crater to the shell of a clam or oyster.

Most of the water of an eruption flows back into the crater. The eruptions are characterized by boiling and overflow.

A tract of ground, about an acre in extent, lying beyond Shell showed marked effects from the quake. Prior there had been but small waterless potholes of earlier existing hot springs in this area. The ground had cooled sufficiently for the encroachment of lodgepole pines. On the morning following the quake many of these former potholes were full of boiling water. Some had erupted. Tree roots extended through the craters. New fumaroles were showing along a series of cracks. Activity is still persisting.

STATION 10—Jewel Geyser is well named. Not only due to sparkling water droplets of an eruption looking like crystals, but much of the glazed, beady structure has the appearance of gems.

During the years Jewel has adhered to a near set type of function. The eruptions have occurred at approximately 5 to 6 minute intervals, and were characterized by 3 or 4 separate bursts, the maximum height being near 25 feet. On the morning of August 18, 1959, like nearby Sapphire, Jewel was ejecting murky water and was in a state of constant activity.

By September 1 the steady activity was becoming periodic, the quiet phase lasting for about one minute, then active for about the same duration. The length of the interval gradually increased until Jewel was back on its pre-earthquake pattern of play.

For further information ask a Park Ranger or inquire at the Old Faithful Visitor Center. There literature can be obtained on the hot springs and other aspects of the Park.

The printing of this folder for your convenience has been made possible by the Park Superintendent and members of the Interpretive Division of Yellowstone. If you wish you may keep this folder. However, if it bears no further value to you, kindly deposit it in the container near the river bridge in order that others may use it.

Thank you!

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